Amendments to the Specification

Please replace page 4, lines 23-24 with the following amended lines:

[5] the DNA according to any one of [1] to [4], wherein the ER-retention signal sequence is the KDEL sequence (SEQ ID NO: 11), the SEKDEL sequence (SEQ ID NO: 12), or the HDEL sequence (SEQ ID NO: 13);

Please replace page 11, lines 10-21 with the following amended lines:

Further, regarding the ER-retention signal sequence of the present invention, for example, the KDEL sequence (SEQ ID NO: 11), the SEKDEL sequence (SEQ ID NO: 12), or the HDEL sequence (SEQ ID NO: 13) can be used; however, the present invention is not particularly limited to these examples. DNA encoding the ER-retention signal sequence of the present invention may contain, for example, a 3'-noncoding region downstream of a DNA encoding the KDEL sequence (SEQ ID NO: 11). Although this 3'-noncoding ~~nonconding~~ region is not particularly limited, it is usually in the range of about 100 to 1000 bp long. As an example, a DNA encoding an ER-retention signal sequence of the present invention is a DNA comprising a DNA encoding the KDEL sequence (SEQ ID NO: 11) and the glutelin 3'-noncoding region of about 650 bp in length downstream of that DNA. In general, as the above-described 3'-noncoding region, the 3'-noncoding regions of genes of storage proteins, such as glutelin, can be preferably used. The NOS terminator or the 35S CaMV terminator can also be used. The aforementioned sequences function to improve the accumulation amount of foreign proteins in storage parts, such as seeds.

Please replace page 17, lines 30-36 and page 18, lines 1-3 with the following amended lines:

Fig. 1 represents a set of drawings and a photograph showing the analytical results of 7 Crp expression in the transformants produced by the vector pGluBsig7CrpKDEL of the present invention. KDEL is SEQ ID NO: 11. The upper panel schematically shows the structure of the plasmid pGluBsig7CrpKDEL. 7 Crp is expressed under the control of the 2.3 k promoter for the glutelin GluB-1 gene. The middle panel is a graph showing the quantitation results of 7 Crp accumulation amount in fully ripened seeds of the transformants obtained, relatively high accumulation amounts being observed in seeds of the lines #1, #10, #15, #17, #31, #34, etc. The lower panel is a photograph showing the results of northern analysis of transcripts of the 7 Crp gene in seeds at the grain-filling stage (about 15 days after flowering) of the transformant of T0 generation.

Please replace page 18, lines 4-12 with the following amended lines:

Fig. 2 represents a set of drawings and a photograph showing the analytical results of 7 Crp expression in the transformants produced by the vector pGluBsig7Crp of the present invention. The upper panel schematically shows the structure of the plasmid pGluBsig7Crp, in which the KDEL sequence (SEQ ID NO: 11) is not added to the 3' -end of the 7 Crp gene. The middle panel is a graph showing the quantitation results of 7 Crp accumulation amount in fully ripened seeds of the transformants obtained. Compared to the case in Fig. 1 in which the KDEL sequence (SEQ ID NO: 11) is added to the 3' -end of the 7 Crp gene, the accumulation amount of 7 Crp is decreased. The lower panel is a photograph showing the results of northern analysis of transcripts of the 7 Crp gene in seeds at the grain-filling stage of the transformant rice of T0 generation.

Please replace page 19, lines 32-36 and page 20, lines 1-5 with the following amended lines:

Fig. 11 represents a set of drawings and a photograph showing the analytical results of 7 Crp expression in the transformants produced by the vector pAGPasesig7CrpKDEL of the present invention. KDEL is SEQ ID NO: 11. The upper panel schematically represents the structure of the plasmid pAGPasesig7CrpKDEL, in which 7 Crp expression is controlled by the promoter for ADP-glucose pyrophosphorylase. The middle panel is a graph showing the quantitation results of 7 Crp accumulation amount in the transformant fully ripen seeds obtained. Although, compared to the case using the 2.3 k GluB-1 promoter, the accumulation amount of 7 Crp was decreased, its accumulation was observed in many lines. The lower panel shows northern analytical results for transcript of the 7 Crp gene in seeds at the grain-filling stage of the transformants of T0 generation.

Please replace page 20, lines 15-19 with the following amended lines:

Fig. 13 represents a set of drawings and photographs concerning comparisons of accumulation amounts of T-cell epitope peptide due to the difference in types of promoters. KDEL is SEQ ID NO: 11. The upper panel is a series of drawings showing the structures of genes using respective promoters. The lower panel is a series of gel electrophoresis photographs comparing accumulation amounts of T-cell epitope peptide.

Please replace page 20, lines 20-24 with the following amended lines:

Fig. 14 represents a set of drawings and photographs concerning comparisons of accumulation amounts of T-cell epitope peptide, due to the localization site thereof. KDEL is

SEQ ID NO: 11. The upper panel is a series of drawings showing the structures of respective genes, in which ChiChi represents "chitinase." The lower panel is a series of photographs comparing the accumulation amounts of T-cell epitope peptide due to the localization site thereof.

Please replace page 20, line 36 and page 21, lines 1-14 with the following amended lines:

An expression plasmid for expressing a Japanese cedar pollen allergen T-cell epitope-linked peptide in rice seeds was prepared. After a promoter for the rice seed major protein glutelin GluB-1 (although 1.3 kb promoter had usually been used, the 2.3 kb promoter was used in the present invention; promoter activity being elevated 5-fold or more), a signal sequence, and a T-cell epitope-linked peptide gene were linked, the ER-retention signal KDEL sequence (SEQ ID NO: 11), which has the function to improve the accumulation amount of a foreign gene product in seeds, was added to the 3' -end of the T-cell epitope-linked peptide to produce the expression plasmid pGluBsig7CrpKDEL. The DNA nucleotide sequence used in Examples comprising the 2.3 kb GluB-1 promoter sequence, the glutelin signal sequence, the 7 Crp epitope sequence, the KDEL sequence (SEQ ID NO: 11), and the 0.6 k GluB-1 3' -sequence, is shown in SEQ ID NO: 6, and the amino acid sequence encoded by the DNA is shown in SEQ ID NO: 7.

In order to examine actions of the signal sequence and the KDEL sequence (SEQ ID NO: 11) toward the expression of the T-cell epitope-linked peptide, the plasmids pGluB7CrpKDEL and pGluBsig7Crp lacking the signal sequence and the KDEL sequence (SEQ ID NO: 11) in pGluBsig7CrpKDEL respectively were also constructed.

Please replace page 22, lines 14-24 with the following amended lines:

On the other hand, as a result of analysis for the pGluBsig7Crp transformants lacking the KDEL sequence (SEQ ID NO: 11), transcripts were detected in 25 out of 38 lines, and, as a result of western analysis for the fully ripened seed protein, accumulation of T-cell epitope-linked peptide was observed. However, as compared to the pGluBsig7CrpKDEL transformants having the KDEL sequence (SEQ ID NO: 11), accumulation amount of T-cell epitope-linked peptide was greatly decreased to 16 μg corresponding to 1.1% of the total seed protein even in seeds of the line showing the highest accumulation amount (Fig. 2).

From the results above, it was proved that a T-cell epitope-linked peptide was successfully produced in rice seeds by introduction of the plasmid pGluBsig7CrpKDEL, that the signal sequence is essential for the expression of a T-cell epitope-linked peptide, and that

accumulation amount thereof is improved by the addition of the KDEL sequence (SEQ ID NO: 11).

Please replace page 25, lines 26-30 with the following amended lines:

An expression plasmid for expressing a Japanese cedar pollen allergen T-cell epitope-linked peptide in rice seeds was prepared. The expression plasmid pAGPase sig7CrpKDEL was constructed by linking the promoter for ADP glucose pyrophosphorylase, a signal sequence, and a T-cell epitope peptide followed by adding KDEL (SEQ ID NO: 11) and Nos-T sequences to the 3' -end thereof. The plasmid structure is shown in the upper panel of Fig. 11.

Please replace page 27, lines 10-28 with the following amended lines:

By adding the ER-retention signal KDEL (SEQ ID NO: 11) so as to accumulate the T-cell epitope peptide in endoplasmic reticulum site, by adding the chitinase signal so as to positively transport the T-cell epitope peptide to the outside of cells to accumulate it into cell wall, or by inserting the peptide to the variable region of glutelin so as to accumulate the peptide as a part of glutelin in the protein-grain II, how the accumulation amount varies was examined. Structures of respective genes are shown in the upper panel of Fig. 14.

Addition of KDEL (SEQ ID NO: 11) resulted in about 4-fold increase in the accumulation amount on the average level. By adding the chitinase signal, the accumulation level decreased to about 1/4 compared to the case of KDEL (SEQ ID NO: 11) addition, and the cell wall could store the T-cell epitope peptide but was not suitable as its accumulation site. The accumulation level of the peptide in the protein-grain II was about the same as that by the KDEL (SEQ ID NO: 11) addition. When two T-cell epitope peptide genes were inserted in tandem into the variable region of glutelin acidic subunit gene, only the glutelin precursor was accumulated but the mature T-cell epitope peptide-inserted acidic subunit was not. These results were probably due to the inhibition of the precursor maturation by insertion of the T-cell epitope peptides or the degradation of the T-cell epitope peptide-inserted acidic subunit.

On the other hand, when two T-cell epitope peptide genes linked in tandem were directly expressed with the addition of KDEL (SEQ ID NO: 11), the accumulation level was elevated as compared to the case of a single T-cell epitope peptide gene addition.